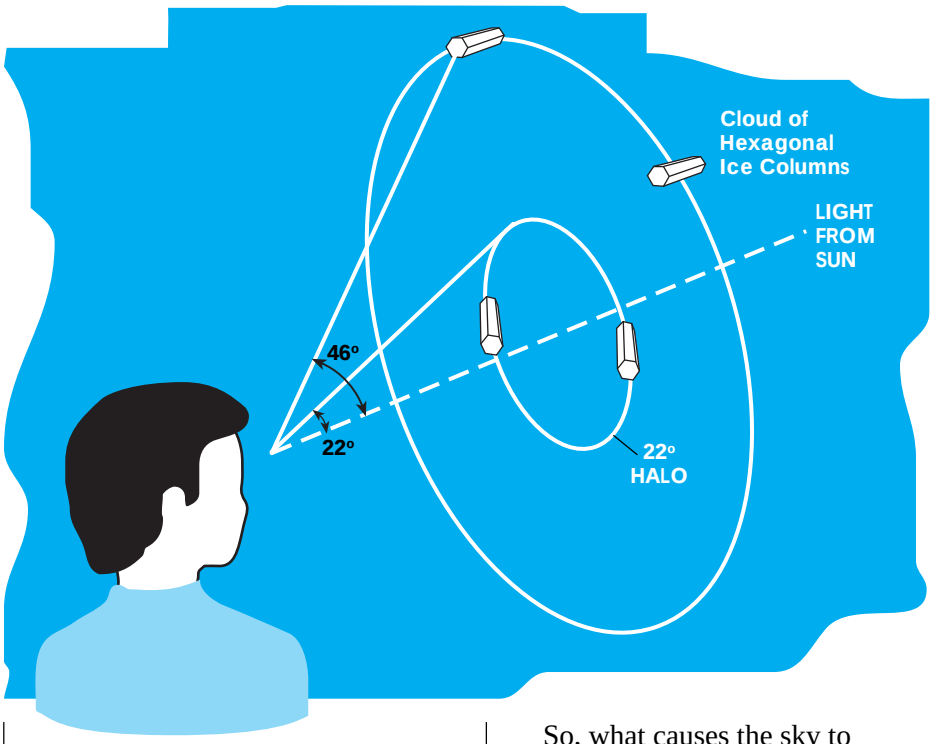
THE
ATMOSPHERIC RESERVOIR
Examining the Atmosphere and Atmospheric Resource Management

What is a SUNDOG?



By Darin Langerud

The sky provides us with many interesting and colorful spectacles; rainbows and aurora borealis (northern lights) to name a few. But what is a sundog? No, it's not a lazy pooch taking a mid-afternoon nap. It's an atmospheric phenomenon that most North Dakotans have seen at one time or another, especially during the winter. Sundogs, or *parhelia* as they are technically known, often appear on cold winter days as bright areas on either side of the sun. The origin of the name "Sundog" is unknown although it is thought that they were given the name because they are always loyal companions of the sun, following it through the sky. They are associated with halos, another phenomenon seen as a ring of light around the sun.

So, what causes the sky to produce these curious effects? First, and most obviously, a bright light source (the sun) must be present. Just as important, however, is the presence of ice crystals. Not only are they important, but they have to be a certain shape; hexagonal, or six-sided, similar to a standard lead pencil. When cirrus clouds composed of these tiny hexagonal crystals are present in the sky between the observer and the sun, the magic starts. As the light from the sun passes through the narrow width of the ice crystals it is refracted, or bent, similar to what happens when light passes through a prism. Because of the shape of the ice crystals, the light is always bent at a specific angle, so the sun dogs always appear at a 22-degree angle from the sun. The prism-like scattering of the sunlight through the ice crystals also spreads the light into a specific color spectrum; red nearest the sun, changing to yellow, green, white, and finally blue on its outer side. Sundogs differentiate themselves from halos because the ice crystals that create them are falling and oriented in the same fashion, while the crystals that form halos are oriented randomly.

Another halo and yet another set of sundogs can also sometimes be seen outside the 22-degree ring. This occurs when light passes through the hexagonal ice crystals, but takes a path that bends the light at a 46-degree angle. These are much less common, however, and much less spectacular than their brighter siblings.

Sundogs can happen at any time of day, but are most common when the sun is low in the sky, either in the morning or late afternoon. To find the right part of the sky, hold out your outstretched arm with your fingers spread out. The angular distance between your thumb and little finger is about 22 degrees. So if you place your thumb on the sun, look past your little finger and if there is anything there to see, you should find it. As always, use caution when observing any phenomena associated with the sun to avoid eye damage. Happy viewing! ■

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